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DIPHThERIA OF THE ŒSOPHAGUS.

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A boy, aged 2 years and 4 months, was admitted moribund to the Grove Fever Hospital on October the 14th, on the eleventh day of disease, and died in seven hours. No antitoxin had been given, diphtheria not having been diagnosed until the day of admission.

Condition on admission.—Profound toxæmia, pulse imperceptible, temperature 97·6° F. Old membrane visible on tonsils, uvula and epiglottis. Pronounced oral fætor, profuse blood-stained nasal discharge. Upper part of right ear swollen and excoriated. Sloughing wound just below left external malleolus. Cultures of the throat, ear, and wound all showed numerous Klebs-Loeffler bacilli.

At the necropsy the tonsils, pillars, uvula, pharynx, epiglottis, aryepiglottidean folds, and interior of larynx showed remains of membrane or varying degrees of necrosis. The loss of substance was most marked in the aryepiglottidean folds and in the left side of the pharynx in which part of the mucous membrane was destroyed and the muscular wall exposed. The mucosa lining the arytenoid and thyroid cartilages showed only minute and superficial areas of ulceration. The trachea was normal.

The Œsophagus in its upper third was apparently normal, the middle third presented some injection of the mucosa, and in the lower third were two longitudinal areas of necrosis, 3·5 cm. each in length, coalescing below, where they measured 2·2 cm. in width, and stopping just short of the lower end of the Œsophagus (*vide* Fig.). In the centre of one of the areas the muscular wall was exposed. No diphtheritic membrane was left, but direct smears and cultures from the necrotic areas showed numerous diphtheria bacilli.

Histological examination showed destruction of the epithelium,

* Specimens of the case were shown at the Section for the Study of Disease in Children of the Royal Society of Medicine, on October the 27th, 1911.

engorgement of the vessels, and considerable round-celled infiltration in the submucous layer extending into the muscular coat. The stomach was normal. The heart and kidneys showed some fatty change, and there were some hæmorrhages in the mesentery. No lesions in the other organs were found.

Involvement of the Œsophagus in diphtheria is a rare event. When it does occur it is usually associated with multiple lesions elsewhere, as in the present case, in which the fances, nostrils,



Diphtheria of the Œsophagus. (From a drawing by M. E. Waring.)

pharynx, larynx and skin were also affected. The condition cannot be diagnosed during life except by expulsion of a cast of the Œsophagus, or by subsequent development of Œsophageal stricture in cases which survive. As a rule, as in this case, it is a necropsy surprise.

The Museum of the Royal College of Surgeons has hitherto contained only two specimens of the kind, the one presented by Dr. Goodhart in 1875 (No. 2292 in Catalogue), and the other by Dr. E. W. Goodall in 1896 (No. 2292A). The specimens of the present case have since been added.

On the other hand, it is probable that if a systematic examination of the œsophagus was made post mortem in every case of diphtheria, membrane would be found more frequently in this situation. Thus among 251 necropsies in diphtheria cases reported by Mallory, definite membrane was found in the œsophagus in twelve cases, or 4·7 per cent. The literature of the subject shows that the diagnosis of diphtheria of the œsophagus was much more frequently made in the pre-bacteriological era than at present, often, indeed, on purely clinical grounds, such as difficulty of swallowing or vomiting, as in cases reported by Greenhow, Burdon Sanderson and Gull. My own case had great difficulty in swallowing, but not more than is usually found in severe faucial and laryngeal diphtheria.

Although post-mortem evidence was present in the cases reported by such well-known authorities as Bretonneau, Bristowe, Jacobi, Jenner, Morell Mackenzie, and Sanné, who may be accredited with a correct diagnosis in spite of the absence of bacteriological confirmation, it is not improbable that some of the early cases in which membrane was found in the œsophagus at the necropsy were due to the action of concentrated hydrochloric acid, which was once much in vogue for the local treatment of diphtheria.

In some of the other cases the disease may have been not diphtheria but scarlet fever, in severe forms of which œsophageal necrosis is an occasional sequela. Thus in a series of 128 scarlet fever necropsies œsophageal ulcers were found in fifteen cases (Oppikofer).

H. D. Fry, of Washington, in 1885 collected fourteen cases of diphtheria of the œsophagus, including one of his own. In seven diphtheria was the primary disease, and in seven it was secondary to scarlet fever, pneumonia, tuberculosis, or other diseases. The membrane involved the œsophageal mucosa either as a tubular lining, or in bands prolonged to the cardia in seven cases. Only two of the fourteen expelled an œsophageal cast.

Since the publication of Fry's paper, which appeared prior to the general recognition of the diphtheria bacillus, I can find records of only eight cases, exclusive of those reported by Mallory. In five the diagnosis was established on bacteriological grounds and post-mortem findings (Goodall, Cautley, Fawcett, Leathem, Field), only one of which (Field's case) expelled an œsophageal cast before death, and in three which recovered the diagnosis was based on the presence of an œsophageal stricture which developed shortly after an attack of diphtheria (Korczyuski, Jungnickel, Danielsen). In Korczyuski's case perforation of the œsophagus occurred, as shown

by the sudden appearance of surgical emphysema in the neck. In Cantley's and Leatham's cases membrane was also found in the stomach post mortem, and in Korezynski's case the frequent hæmatemesis and persistent pain in the epigastrium suggested a gastric ulcer of diphtheritic origin.

A striking feature in the present case was the marked destruction of tissue which was found, not only in the œsophagus but also in the pharynx. Although neither of the specimens already alluded to in the Royal College of Surgeons' Museum shows any such changes, necrotic lesions in the œsophagus have been met with in other cases and are due to secondary infection, especially by cocci (Danielsen). It is readily conceivable that had my case recovered, cicatrisation of the lesions would have led to stricture. Post-diphtheritic stricture of the œsophagus, though an extremely rare occurrence, has been recorded in the pre-bacteriological era by Gendron, Lenbe and Penzoldt, and Trendelenburg, and more recently by Korezynski, Jungnickel, and Danielsen. In all the cases recovery followed gradual dilatation of the stricture by bougies. In some of the cases, especially those reported by the earlier writers, the obstruction to the passage of food may have been due to diphtheritic paralysis, but in others an undoubted cicatricial stenosis, sometimes multiple, existed, for which no other cause than diphtheria could be discovered.

The localisation of diphtheria in the œsophagus in the present case is difficult to explain, especially as there was no history of tube feeding or of the passage of bougies. In children already suffering from œsophageal stricture as the result of swallowing lye, an attack of diphtheria is apt to be very severe. Jacobi and Baginsky have each recorded fatal cases. The œsophageal cicatrices in both these cases were invaded by diphtheritic membrane, the frequent use of bougies having predisposed the stricture to infection.

In my own case the œsophagus was probably affected by the diphtheritic process at an early stage of the disease, as the membrane had entirely separated at the necropsy.

REFERENCES.

- (1) BAGINSKY, A.—'Diphtherie,' 1898, p. 202.
- (2) BRETONNEAU, P.—'Memoirs on Diphtheria,' 'New Syd. Soc.,' 1859, pp. 18 and 77.
- (3) BRISTOWE, J. S.—'Trans. Path. Soc. Lond.,' 1859, x, p. 333.
- (4) CAUTLEY, E.—'Rep. Soc. Study Dis. Child.,' 1902-3, iii, p. 234.
- (5) DANIELSEN, W.—'Beitr. z. klin. Chir.,' 1909, lxxiii, p. 257.

- (6) FAWCETT, J.—‘Trans. Path. Soc. Lond.,’ 1906, lvii, p. 336.
- (7) FIELD, F. E.—‘Lancet,’ 1907, i, p. 161.
- (8) FRY, H. D.—‘Amer. Journ. Med. Sci.,’ 1885, n.s., xc, p. 329.
- (9) GENDRON.—‘L’Union Médicale,’ 1860, n.s., v, p. 569.
- (10) GOODALL, E. W.—‘Trans. Path. Soc. Lond.,’ 1896, xlvii, p. 39.
- (11) GREENHOW, E. H.—‘Diphtheria,’ 1860, pp. 183-5.
- (12) GULL, W.—‘Second Rep. Med. Off. Privy Council,’ 1860, p. 300.
- (13) JACOBI, A.—‘Treatise on Diphtheria,’ 1880, p. 83.
- (14) JENNER, W.—‘Diphtheria: Its Symptoms and Treatment,’ 1861, p. 8.
- (15) JUNGnickEL, H.—‘Prag. med. Woch.,’ 1903, xxviii, p. 489.
- (16) KORCZYNSKI.—‘Centralbl. f. klin. Med.,’ 1883, iv, p. 542.
- (17) LEATHAM, A.—‘Rep. Soc. Study Dis. Child.,’ 1905-6, vi, p. 239.
- (18) LEUBE AND PENZOLDT.—Quoted by Fry, *loc. cit*
- (19) MALLORY, F. B.—In ‘Bacteriology of Diphtheria,’ 1908, p. 97.
- (20) MORELL MACKENZIE.—‘Manual of Dis. Nose and Throat,’ 1884, ii, p. 69.
- (21) OPIKOFER, E.—‘Arch. f. Laryngol.,’ 1911, xxv, p. 145.
- (22) SANDERSON, B.—‘Second Rep. Med. Off. Privy Council,’ 1860, p. 267.
- (23) SANNÉ.—‘Traité de la Diphthérie,’ 1877, p. 64.
- (24) TRENDLENBURG.—Quoted by Fry, *loc. cit*.



DIPHTHERIA OF THE ŒSOPHAGUS.*

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A BOY, aged 6 years, was admitted to hospital on March the 22nd, 1913, on the fifth day of disease. Death took place within one hour of admission.

Condition on admission.—Profound toxæmia, pulse imperceptible, temperature 99° F.

Palatal and faucial œdema, membrane on tonsils, pillars and palate, considerable neck swelling, oral fœtor and profuse nasal discharge. Slight stridor, croupy cough and recession.

The specimen (*vide* Fig.) shows a normal condition of the upper part of the œsophagus. The lower 1½ in. present longitudinal areas of congestion and submucous hæmorrhages. A small piece of membrane is visible at the upper end of this congested area, and there are larger areas of membrane present at the cardiac end.

Membrane was also found in the fauces and palate, naso-pharynx, larynx and trachea. The stomach was normal. Pure cultures of Klebs-Loeffler bacilli were obtained from the lesions in the throat and œsophagus. The other organs presented nothing worthy of note.

The case illustrates an early stage of the invasion of the œsophagus by diphtheria, and should be compared with that which I reported in October, 1911. In both cases the lesions were confined to the lower end of the œsophagus, and in both there were multiple diphtheritic lesions elsewhere associated with profound toxæmia.

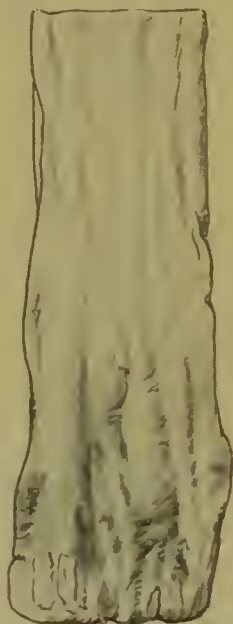
The first case, however, was in a much later stage, as the membrane in the œsophagus had separated, leaving necrotic areas. Reference should also be made to the striking coloured drawing of

* A specimen of the case was shown before the Section for the Study of Disease in Children of the Royal Society of Medicine on April the 25th, 1913, and is now in the Museum of the Royal College of Surgeons.

diphtheria of the Œsophagus in the second edition of Baginsky's monograph.

Probably diphtheria of the Œsophagus is not so rare as is generally supposed, although there are details of only twenty-four cases on record, including these two of my own. Fourteen of these occurred in the pre-antitoxin era, and in the rest antitoxin was either not given at all or else too late.

In my last paper I said that it was probable that if a systematic examination of the Œsophagus were made post mortem in every case of diphtheria, membrane would be found more frequently in this



Diphtheria of the Œsophagus. (From a drawing by M. E. Waring.)

situation, and quoted the observations of Mallory, who found definite membrane in the Œsophagus in twelve cases, or 4.7 per cent. among 251 necropsies in diphtheria cases.

During the last eighteen months, *i. e.* since I reported my last case, I have examined the Œsophagus in ten cases of diphtheria which died in the acute stage, and in two cases, in which the present is included, I have found Œsophageal membrane present.

The other case was that of a girl, aged 6 years, admitted to hospital with very severe faucial, nasal and laryngeal diphtheria, on the ninth day of disease. Death occurred within twenty-four hours, in spite of large doses of antitoxin, and, post mortem, the

lesions in the fauces, naso-pharynx and larynx were almost identical with those seen in the present case.

In connection with unusual situations of diphtheria in the alimentary tract, it should be noted that while diphtheria of the œsophagus and stomach is usually fatal, four cases of diphtheria of the intestines have recently been recorded, all of which recovered, while only two were followed by paralysis. A few cases of diphtheria of the œsophagus have ended in recovery, but with the development of a stricture. I referred to a certain number of these cases in my last paper, and since then another case has been reported by Réthi.

REFERENCES.

- (1) BAGINSKY, A.—‘Diphtherie und diphtheritischer Croup,’ Wien, 1913, p. 100.
- (2) RÉTHI, A.—‘Berl. klin. Woch.,’ 1912, xlix, p. 2405.
- (3) ROLLESTON, J. D.—‘Brit. Journ. Child. Dis.,’ 1912, ix, p. 12; and ‘Lancet,’ 1913, i, p. 129.
- (4) TYLECOTE, F. E.—‘Brit. Journ. Child. Dis.,’ 1913, x, p. 211.

